by Owen forty years ago. Now our friends at Berlin are congratulating themselves because they have obtained a single individual, and are trying to make out that the animal has never been properly figured !

AMONGST the recent additions to the Zoological Society's reptile house are several specimens (deposited by the Hon. Walter Rothschild, M.P.) of the very curious large iguanoid lizard (*Conolophus subcristatus*) which inhabits the central islands of the Galapagos group, and the habits of which were described by Darwin in his "Naturalist's Voyage" (vol. iii. p. 469). It is a terrestrial species, and is stated by Darwin to be so numerous in certain districts that he and his companions could scarcely find a spot free from their burrows on which to pitch their tent. Closely allied to it is a large marine species of lizard (*Amblyrhynchus cristatus*), also confined to the Galapagos group, which lives exclusively on the rocky sea-beaches and is said "to go out to sea in shoals to fish." Living examples of the latter species were also brought away by Mr. Beck, Mr. Rothschild's collector, from the Galapagos, but, unfortunately, they did not reach England alive.

WE have received parts xii. and xiii. of the *Bulletin* of the Geological Commission of Finland, containing papers on the crystalline rocks of the country by B. Frosterus, and on a meteorite by W. Ramsay and L. H. Borgström.

THE *Transactions* of the Leicester Literary and Philosophical Society (vol. vii. part i., July, 1902) contain useful geological maps by Mr. Fox Strangways, on the scale of two inches to a mile, illustrating excursions made to parts of the Soar and Wreak valleys; and there is an instructive infra-Triassic map of Charnwood Forest by Prof. W. W. Watts. There is also a detailed report, with map, on the geology of the Beaumont Leys Estate, near Leicester, by Mr. Montagu Browne. Geology evidently flourishes in this Society under the enthusiastic leadership of Mr. H. A. Roechling.

FROM the New Mexico College of Agriculture and Mechanic Arts we have received *Bulletins* Nos. 42 and 43, in which Mr. J. D. Tinsley deals with the problem of alkali in the soil, and with drainage and flooding for its removal. Sodium carbonate is the essential constituent of "black alkali," as it appears to blacken the vegetable matter in the soil; while other salts of soda, as well as salts of magnesia and lime, help to form what is termed "white alkali" soil. It is pointed out by the author that the alkali is left in the soil by the evaporation of water that has gradually risen to the surface. When this excess of water is removed, the alkali will cease to accumulate and soon be washed out of the soil.

THE latest issue (1900–1901) of the *Proceedings* of the Royal Physical Society of Edinburgh contains a full report of the presidential address delivered by Mr. B. N. Peach in November, 1900, the subject of which is Scottish palæontology during the last twenty years. Full justice is done to workers in all branches of this science, while special attention is directed to the important service rendered by palæontological investigations to the task of unravelling the geological sequence in the Highlands. "The work done in Scotland during the period under consideration has thoroughly established the paramount value of palæontology in the interpretation of the geological structure of the country."

DR. G. T. MOODY describes a new "laboratory shaking machine" in the *Chemical News* of November 7. As a shaking machine capable of giving satisfactory results in the laboratory has long been sought by chemists, it is worth while to direct attention to that devised by Dr. Moody.

A SECOND enlarged and revised edition of "Das Wachstum des Menschen," by Dr. Franz Daffner, has been published by Mr. W. Engelmann, Leipzig (London: Williams and Norgate). The volume contains many interesting papers on the rate and character of the development of the different parts of the human body from embryonic stages to maturity.

IN the numbers of the *Journal* of the Society of Arts for October 17, 24, 31 and November 7 are reprinted the four Cantor lectures recently delivered by Dr. R. T. Glazebrook, F.R.S., on "Glass for Optical Purposes." The first lecture deals with the optical purposes for which glass is used and what it is that the glass used has to do. The defects of microscopes and the way in which they are cured or improved, chiefly by means of the use of glass of varying refrangibility and lenses of different curvature, are included in the second lecture; photographic lenses are considered in the third, and lenses for telescopes in the fourth lecture. Students of optics will find in the lectures a wealth of accurate and instructive information upon many points of interest.

SOME very interesting observations relative to the cause and nature of radio-activity have been recently made by Messrs. Rutherford and Soddy, an account of which is given in the September number of the *Philosophical Magazine*. The experiments were carried out with thorium compounds, all of which are radio-active. The authors arrive at the conclusion that the greater part of the radio-activity of thorium is due to a non-thorium type of matter, represented symbolically by ThX, possessing distinct chemical properties. The activity of this new type is not permanent, but undergoes a gradual process of decay, the value falling to one-half in about four days. The constant radio-activity of thorium is supposed to be maintained by the continuous production of this new type of matter from the thorium compounds. Its rate of production and the rate of decay of its activity appear to be independent of the physical and chemical conditions of the system. The ThX is capable of exciting radio-activity on surrounding inactive bodies, and about 20 per cent. of the total activity of thorium is due to this action of the ThX. By suitable means, thorium can be freed from both ThX and the excited radio-activity produced by the latter, and then possesses an activity about 25 per cent. of its original value. This latter, the authors believe, is due to a second non-thorium type of matter.

THE additions to the Zoological Society's Gardens during the past week include two Chacma Baboons (*Cynocephalus porcarius*) from South Africa, presented respectively by Mr. C. S. Blundell and Captain P. J. Probyn, D.S.O.; a Vervet Monkey (*Cercopithecus lalandii*) from South Africa, presented by Mr. J. H. Kirby; two Prairie Marmots (*Cynomys ludovicianus*) from North America, presented by the Countess de Grey; a White-collared Mangabey (*Cercocebus collaris*), a Rose-ringed Parrakeet (*Palaeornis docilis*) from West Africa, deposited; two Brown Pelicans (*Pelecanus fuscus*) from the West Indies, received in exchange.

OUR ASTRONOMICAL COLUMN.

CHANGE OF FOCUS IN THE LIGHT FROM NOVA PERSEI.—As previously recorded in these columns (July 3), Prof. E. E. Barnard made several determinations, during 1901, of the visual focus of the light from Nova Persei, in order to determine if the presence of the nebula lines in its spectrum produced the difference from stellar focus observed in the case of planetary nebulæ; his observations showed no decided difference of focus.

Observations made on July 14, August 29, September 1 and September 16 of this year produced a like negative result, and

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the colour of the Nova was recorded as "a pale bluish white" on each occasion.

However, further observations, made on October 6, 7 and 14, indicate that the Nova has now assumed a bluer colour than hitherto observed, and that the visual focus is now about 0·2 inch greater than that of a star, that is to say, it now corresponds with the visual focus for planetary nebulæ. Prof. Barnard is certain that this change has taken place since August 29 of this year (*Astrophysical Journal*, vol. xvi. No. 3).

NEW MINOR PLANETS.—In No. 3826 of the *Astronomische Nachrichten*, Prof. Max Wolf records yet another batch of seven new minor planets, all of which were discovered, photographically, on October 25.

The planet 1902 K.E., discovered on October 25, has since proved to be identical with (19) Fortuna, the previously published ephemeris of which was incorrect. A new ephemeris is now given.

The minor planets (477) [1901 G.R.] and (478) [1901 G.U.], discovered by Dr. Carnera, have been named Italia and Tergeste respectively.

OBSERVATIONS OF THE AURORA.—A very interesting and valuable series of observations of the Aurora, which have been made at the Yerkes Observatory during the period 1897–1902, are recorded and commented upon by Prof. Barnard in the current number of the *Astrophysical Journal*.

The observations are recorded *in extenso*, and contain full details of the various phenomena attending the displays. Special notice is made of several interesting features, amongst them being the bank of apparent cloud which has a dark, smoky appearance and generally fills the space on the under side of the auroral arch. This cloud generally gives the appearance of being densely opaque, but that this is not the case is shown by the fact that the observations record the bright appearance of Vega as seen through the apparent cloud. The "pulsating clouds," which are generally 5° to 10° in diameter, are recorded as "fading out and quickly brightening again, as if someone were capriciously turning on and off their light." Another striking feature of the subject, which Prof. Barnard believes to be of importance, is the greatly varying altitudes of the summits of different auroræ, and these are carefully noted in the observations. The positions of the summits of various auroræ are generally recorded as being 20° to 25° east of north. A singular appearance—unique in Prof. Barnard's observations of these phenomena—was that of a quarter of an auroral arch on February 15, 1899, no other signs of auroral display being visible at the time.

The Yerkes observations of the grand aurora of September 10, 1898, which was accompanied by decided magnetic effects, describe it as the grandest display observed throughout the whole period, and state that the light in the north was so intense, at times, as to cast a distinct shadow.

As Prof. Barnard remarks, these observations, which cover a period of sun-spot minimum, will doubtless be important in their bearing on the connection between sun-spots and auroræ.

COOPERATION IN OBSERVING STELLAR RADIAL VELOCITIES.—Prof. E. B. Frost, having been struck by the fact that it is not possible to find, amongst published observations, a dozen stars the radial velocities of which have been determined at more than three different observatories, has sent a circular letter to the recognised workers in this field of astronomical physics asking them to join in a cooperative scheme for observing the radial velocities of the stars given in a mutually selected list.

All of the observers to whom the letter was addressed, seven in number, have agreed to the general scheme, and a primary list of about ten stars has been decided upon. Their programme, for the present, includes the making of three determinations of the radial velocity of each star in the list, per annum, by each observer (*Astrophysical Journal*, October.)

THE MARKINGS ON VENUS.—Prof. Percival Lowell, of Boston, has written to the *Astronomische Nachrichten*, No. 3823, suggesting that the spoke-like markings of the planet Venus are not really present on the surface of the planet, but that their appearance is due to an optical effect produced by the eye wandering from the dark indentations which are seen along the terminator, and the smaller spots and streaks, to the centre of the disc. To test this theory, Prof. Lowell has observed a large number of artificial discs, marked without his knowledge, and set up at a distance so as to be, as nearly as possible, under the same observing conditions as the planet.

These experiments tend to prove his theory, but are not sufficiently decisive to place the non-objective existence of these peculiar markings beyond doubt; therefore Prof. Lowell, for the present, only enters a caveat against the acceptation, as a fact, of their real existence.

THE NERNST LAMP.

THE Nernst lamp can now be said to be well upon its way from the experimental to the commercial stage. It has appeared strange to many people that it has taken such a long time before lamps could actually be bought for use, but a critical examination of the lamps now to be had causes one to wonder, not that its development has taken a long time, but that it has been possible to practically develop it at all. Of all artificial methods of illumination it is the most complicated, and its various auxiliary parts are in themselves inventions requiring for their inception no ordinary genius and perseverance. The Nernst lamps now to be had in England are made by the Allgemeine Elektricitäts Gesellschaft of Berlin. The only other manufacturer of Nernst lamps is the Nernst Lamp Company of the United States, which has acquired the rights for that country. The demands of the rest of the world are being supplied by the A.E.G., the agent of whom for the British Colonies, Asia, Africa and South America is the Nernst Electric Light, Limited, of London, which, in the form of an attractive pamphlet, has just issued a description of the various lamps it is prepared to sell.

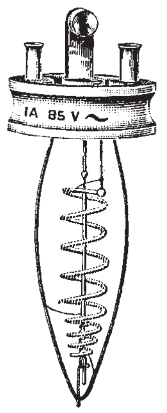

FIG. 1.

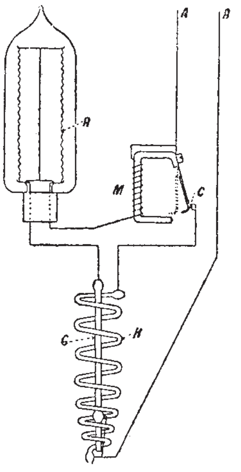

FIG. 2.

The lamps are of two types and are rated by current, not, as is usual with incandescent lamps, by candle-power, viz. 0·25, 0·5 and 1·0 ampere lamps. The watts consumed per candle-power are about 1·8.

The larger lamp used for all high candle-powers, *i.e.* 50 candle-power and upwards, consists of three parts, the carrier, the lamp body and the globe. The current is led into the lamp body by insulated plug contacts, on the withdrawal of which the lamp is rendered entirely dead and can be handled with safety. The lamp body contains the magnetic cutout for interrupting the current through the heater, after the glower has lighted up, also the series resistance. The contacts for the replacement piece are also carried by the lamp body. This is shown in Fig. 1, and consists of a round piece of porcelain on which are fixed the heater and glower. The general connections of the lamp, as also the functions of its several essential parts, can be seen by reference to Fig. 2. On first switching on current to the lamp, the circuit is closed through the armature and contact C of the cutout M, and through the heater H. The heater is a marvel of ingenuity. It consists of an exceedingly fine platinum wire wound on a rod of porcelain, the rod being in the form of a spiral in the axis of which the glower G is placed. The method of manufacture adopted is to wind the straight rod with the wire, then to cover

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